Space Weather Forecast

Issued on Tuesday, 11 October 2022 at 13:22 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate-class X-ray flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate over the past 24 hours, with a moderate-class flare originating from a large sunspot region located in the northwest quadrant. Awaiting imagery for any potential coronal mass ejection (CME), which could have an Earth-directed component. There are currently five numbered sunspot groups on the Earth facing disc. The region in the northwest remains the largest group, which has recently produced moderate class flares due its magnetic complexity. The remaining sunspots on the disc are all relatively stable and small, with no significant flares observed from these regions. No Earth-directed CMEs were visible on available imagery through the period.

Solar Wind / Geomagnetic Activity: The solar wind declined from elevated to slightly elevated levels. The Interplanetary Magnetic Field was weak throughout. The all important north-south component was also weak. Geomagnetic activity was Quiet to Unsettled.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to be Low to Moderate. This may reduce somewhat into the period as current sunspots look to simplify slightly, but with Moderate still possible particularly as one or more active regions are likely to rotate over the eastern limb onto the visible disc in the coming days.

Solar Wind / Geomagnetic Activity: There are no major Earth-directed CMEs in the forecast, however the 07/0730UTC filament eruption CME may pass close to the Earth late on the 11th or early on the 12th October, giving some very slight peripheral influences. Otherwise, ongoing fast winds are likely to continue to ease through day 1 (11th), likely approaching background by day 2 (12th). Some enhancement is possible at times due to possible glancing CME effects. However, a recent moderate-class flare from largest sunspot on the disc may produce a CME, awaiting further imagery for confirmation. Given it's location in the northwest, any CME could potentially be Earth-directed. Largely Quiet to Unsettled but with a risk of Active intervals late on day 1 or early on day 2 (11th or 12th) due to possible glancing CME effects and a slight chance of an isolated Minor Storm interval for the same region.

Energetic Particles / Solar Radiation: Solar radiation storms should be at background, but with a daily slight chance of rising in response to any large x-ray flares, primarily from the largest sunspot groups.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	10	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	50	50	50	50
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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